USSR

UDC 669.28

FREZE, N. I., BIRYUKOVA, T. A., and MURZINOV, N. A.

"Feautes of Melting Alloys of the Mo-C-Ni System"

Moscow, Tsvetnyye Metally, No 7, Jul 72, pp 81-83

Abstract: The purpose of this work was to study the effect of melting method on the loss and distribution of nickel in the cross section of ingots of alloy TSM-3 (0.01-0.10% Ni, 0.05-0.10% C, balance Mo). The cold brittleness temperature of the cast metal was also studied. Ingots were melted in an electron-beam furnace and in vacuum-arc furnaces operating on d-c and a-c current. For electron-beam melting an 80-mm-diameter crystallizer was used. A 110-mm-diameter crystallizer was used for electric-arc melting. In the process of electron-beam melting of the electrodes, a large nickel loss resulting from vaporization and segregation throughout the ingot was observed. Use of electrodes made of alloyed nickel and carbon pellets made it possible not only to reduce nickel loss during melting but also to significantly improve the uniformity of nickel distribution. Arc melting in a "dry" crystallizer using d-c current led to an extremely nonuniform distribution of nickel in the cross section of the ingot caused by condensation of the vaporizing nickel on the crystallizer walls, enriching the surface layers. When a-c current was used
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FREZE, N. I., etal, Tsvetnyye Metally, No 7, Jul 72, pp 81-83

for arc melting, very little nickel segregates, owing to the constant infusion
of the molten ingot.

Ingots obtained from a single electric-arc remelt exhibited an almost
complete absence of nickel segregation. The nickel loss here amounted to 80-
85%, but the high concentration content of oxygen in the electrode increased
the oxygen content in the ingots (up to 0.007%). The use of combined electrodes
(unalloyed pellets of high-purity Mo and Mo pellets alloyed with carbon as well
as nickel plate) helped to lower the content of gas impurities. Cold brittle-
ness of alloy TSM-3 was determined from the change in bend angle in which the
temperature of transition from ductile to brittle was taken as the minimum
temperature at which samples could be bent 90°. The alloy produced by electron-
beam melting had the lowest cold brittleness temperature, while the alloy pro-
duced by single electric-arc remelting had the highest transition temperature.
It was established that the higher the rate of crystallization, the higher the
degree of solid solution saturation by interstitial elements and the higher
the cold brittleness temperature. 3 figures, 1 bibliographic reference.

2/2

Heat Treatment

USSR   UDC 621.791.856:669.28

ALEKSEYENKO, G. N., NERODENKO, M. M. (Electric Welding Institute imeni YE. O. PATON, Academy of Sciences Ukrainian SSR), BIRYUKOVA, T. A., DANIYELYAN, T. A., MAL'TSEV, M. V., FREZE, N. I.,and SHCHUKIN, A. A. (Moscow)

"Effect of Heat Treating on the Properties of Molybdenum-Carbon-Nickel Alloys and Their Weld Joints"

Abstract: The study deals with the properties of intermediate products from TSM-3 structural molybdenum alloy (0.05-0.10% wt % C and 0.01-0.10% Ni) following annealing. The specimens were tensile-tested at room temperature, at $2.5 \cdot 10^{-3}$ sec^{-1} deformation rates and were arc-welded in a controlled inert-gas atmosphere. The specimens were pre-annealed for 1 hour in vacuum (10^{-5} mm Hg) at 800, 1100, 1200, 1300, 1400, 1500, 1600, and 1700°C. Metallographic examinations indicate that recrystallization begins at 1200°C and is completed at 1400°C. Maximum plasticity was shown by specimens with a completely recrystallized structure. Pre-annealing appears to upgrade the weld quality. Nickel tends to concentrate along the grain boundaries and not only hinders carbon diffusion, but also
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ALEKSEYENKO, G. N., et al, Avtomaticheskaya svarka, No 4, Apr 72, pp 47-49

promotes strengthening of the metal bond in the boundary layers owing to the localized increase of electron concentration. This strengthening of grain boundaries by nickel appears to be the determining factor in raising the plasticity of TSM-3 alloy in recrystallized state. (2 illustrations, 3 tables, 4 bibliographic references)

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USSR

UDC 621.791.011:669.28

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.GUREVICH, S. M., NERODENKO, M.M., ALEKSEYENKO, G. N., Institute
of Electric Welding imeni Ye. O. Paton, Academy of Sciences,
Ukrainian SSR, BIRYUKOVA, T. A., and SHCHUKYN, A. A., Moscow

"Weldability of Some Molybdenum Alloys"

Abstract: A study was made of the weldability of molybdenum
alloyed with carbon and group VIII elements (iron, cobalt, nickel,
and irridium). The test procedure is described, and the mechani-
cal properties of welded joints of the molybdenum alloys are
tabulated. It was found that iron, cobalt, nickel, and irridium
refine the structure of the weld. Group VIII elements increase
the difference between the ultimate strength and yield point
of joints made of alloys of molybdenum with carbon. In the entire
investigated range of concentrations of these elements, the ratio
$\sigma_{0.2}/\sigma_b$ during bending is minimal for joints of molybdenum-
carbon-nickel and molybdenum-carbon-irridium alloys. With an in-
crease in iron content the ultimate strength of the joints of

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GUREVICH, S. M., et al., Avtomaticheskaya Svarka, No 3, Mar 71, pp 27-29

molybdenum-carbon-iron alloys increases.

The mean hardness of welded joints of molybdenum alloys with δ = 1 mm at various distances from the weld is plotted. These data show that an increase in hardness along the axis of the wled and a decrease at the fusion line are especially characteristic for alloys of the molybdenum-carbon system. Group VIII alloying of molybdenum with carbon leads to a smoother variation of hardness with respect to joint cross section; irridium and nickel have the most favorable effects.

2/2

Acc. Nr.   Abstracting Service: Ref. Code   3
  AA0108179   CHEMICAL ABST. 6-70   uR C482

B

135550m Tool steel. Zaichenko, S. S.; Polushkin, N. A.;
Kalmykov, Yu. D.; Chichkanov, A. I.; Shevchenko, V. L.;
Biryukova, V. N.; Aref'ev, B. V. U.S.S.R. 260,900 (Cl. C 22c),
06 Jan 1970, Appl. 25 Jul 1968; From *Otkrytiya, Izobret., Prom.
Obraztsy, Tovarnye Znaki* 1970, 47(4), 81. Tool steel contg.
lower amts. of scarce materials consisted of: C 0.50–0.65, Si
0.60–0.90, Mn 0.20–0.40, Cr 6.5–8.0, Mo 1.1–1.5, W 0.7–1.1,
V 0.10–0.25, Ti 0.05–0.15%, Fe and impurities the remainder.
                                                 MSCL

REEL/FRAME

19891845

TITLE--SENSITIVITY OF THE NORMAL VIBRATIONS FOR AN ANTIMONY TRIHALIDE TO
   ITS STRUCTURAL PARAMETERS -U-

AUTHOR-(02)-KOZULIN, A.T., BIRYULINA, L.V.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(2), 248-50

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL BONDING, MOLECULAR STRUCTURE, ANTIMONY CHLORIDE,
   BROMIDE, VIBRATION FREQUENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0086   STEP NO--UR/0051/70/028/002/0248/0250

CIRC ACCESSION NO--AP0054883
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0054883

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A LINEAR DEPENDENCE OF THE
FREQUENCIES OF NORMAL VIBRATIONS OF $SBCL_3$ AND $SBBR_3$ ON THE
CHANGE OF FORCE COEFFS. WAS FOUND. VALENCY VIBRATIONS SHOW NO
SENSITIVITY TO THE CHANGE OF THE K_{IJ} AND L'_{IJ} FORCE
COEFFS., WHEREAS THE DEFORMATION VIBRATIONS ARE NOT SENSITIVE TO THE
CHANGE OF THE K_I AND H'_J SUBI FORCE COEFFS. THE DEPENDENCE OF
NORMAL VIBRATIONS ON THE CHANGE OF BOND ANGLE AND BOND DISTANCE IS
DISCUSSED.

UNCLASSIFIED

USSR   UDC 546.65'185

BIRYULINA, V. N., and SEREBRENNIKOV, V. V., Tomsk State University

"Rare-Earth Element Phenylhydroxyethylphosphonates"

Abstract: Phenylhydroxyethylphosphonates of the rare earth elements (REE) have the formula $Ln_2[C_6H_5(COH) \cdot (PO_3)CH_3]_3nH_2O$ where Ln stands for lantanides, excluding promethium. A series of such complexes was obtained by mixing concentrated aqueous solutions of REE salts and α-phenyl-α-hydroxyethyl-phosphonic acid (PHEPA) neutralized with KOH. It was shown that complexes with the formula $[LnC_6H_5C(OH)(PO_3H)CH_3]^{2+}$ where Ln = La^{3+}, Sm^{3+}, Gd^{3+}, Dy^{3+}, Ho^{3+}, Lu^{3+} exhibit stability constants of the order of 10^2-10^3 in the series La-Lu.

1/1

Organophosphorous Compounds

"Phosphonates of Rare Earth Elements"

Abstract: The preparation, composition, and some properties are given for the phenyl- (Ph) and α-phenylvinyl(PhV) phosphates of the rare earth elements (REE). The (Ph) have the general formula $Ln_2(C_6H_5PO_3)_3$ and the (PhV) have either the acidic form $Ln[C_6H_5C(PO_3H)CH_2]_3 \cdot nH_2O$ or the neutral $Ln_2[C_6H_5C(PO_3)CH_2]_3 \cdot nH_2O$, Ln being the series of elements Y through Lu. Phenylphosphonic or α-phenylvinylphosphonic acid is used as the starting material. The Ph salts are only slightly soluble in water; the acid PhV are about twice as soluble as the Ph. Both Ph and PhV are soluble in mineral acids; both are also practically nonsoluble in organic solvents. Density, optical rotation, and Ir maxima were determined. Based on the Data given, conclusions were made concerning the bonding in these phosphonates.

1/1

USSR   UDC 616.988.25-07:[616.153.1+616.832.9-008.831]-074

BIRYULYA, Ye. M., Clinic of Acute Neuroinfections, Institute of Poliomyelitis
and Virus Encephalitides, Academy of Medical Sciences USSR, Moscow

"Enzymatic Activity of the Blood Serum and Spinal Fluid in Tickborne Encepha-
litis and Similar Diseases"

Abstract: The enzymatic activity of blood serum and spinal fluid was studied
in patients afflicted with tickborne encephalitis and other acute neural in-
fections. The activity of lactic dehydrogenase, aldollase, glutamic-oxalocetic
transaminase, and glutimic-pyruvic transaminases in blood serum and spinal
fluid was determined. A slight but statistically significant increase in en-
zymatic activity was observed for patients with tickborne encephalitis, as
compared to patients with fever not associated with encephalitis. The enzymatic
activity of the spinal fluid depends on the severity of the disease. It is
greatest in patients with the focal form of tickborne encephalitis and somewhat
less in patients with the meningeal form. As the patient's condition improves,
enzymatic activity decreases in both blood serum and spinal fluid and the

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USSR

activity of glutamic-pyruvic transaminase and aldolase are normalized. The data obtained can be used in differential diagnosis, in the solution of therapeutic problems, and in the prognosis of tickborne encephalitis.

2/2

USSR   UDC 616.988.25-022.395.42+616.988.3-07:[616.832.9-008.831+616.153.1]-074

BIRYULYA, Ya. M., Clinic of Acute Neurological Infections, Institute for Poliomyelitis and Virus Encephalitides, Academy of Medical Sciences USSR, Moscow

"Biochemical Shifts in the Organism During Tickborne Encephalitis and Other Acute Neurological Infections"

Abstract: The activity of aldolase, lactic dehydrogenase, and glutamic-oxalacetic and glutamic-pyruvic transaminases was investigated in the cerebrospinal fluid and blood serum of 164 patients with acute tickborne encephalitis, related febrile diseases, and suppurative and serous meningitis. Enzymatic activity was distinctly increased, especially in the cerebrospinal fluid, the extent of increase varying with the severity of the clinical form of the disease, the condition of the patient, and the intensity of the neurological symptoms. In patients with the focal form of tickborne encephalitis, enzymatic activity in the cerebrospinal fluid reached a peak at the time that paresis and paralysis developed. As the condition of patients improved, enzymatic activity decreased in the cerebrospinal fluid. Aldolase and lactic dehydrogenase activity was much higher in suppurative meningitis than during tickborne encephalitis or serous meningitis. The difference in levels of enzymatic activity in the cerebrospinal fluid during these neurological diseases suggests that enzymatic tests might be useful for purposes of differential diagnosis.

USSR   UDC 612.17.014.21-06:612.766.2

KOPTEVA, L. A., BIRYUZOVA, V. I., and SHUL'ZHENKO, Ye. B., Institute of Normal
and Pathological Physiology, Academy of Medical Sciences USSR, and Institute of
Molecular Biology, Academy of Sciences USSR, Moscow

"Biochemical and Electron-Microscopic Characteristics of Dog Heart Mitochondria
During Hypokinesia"

Abstract: After dogs had been kept in a state of hypokinesia for 15 days, their
heart weight was reduced by 20-25% and the quantity of heart mitochondria de-
creased. The concentration of high-polymer RNA in the mitochondria decreased by
50.8% in the left ventricle and by 27.5% in the right ventricle. The capacity of
mitochondrial proteins to incorporate C^{14}-labelled amino acids (proline, valine,
arginine, serine, and threonine) decreased by a factor of 4.5 for the left
ventricle and 2.5 for the right ventricle. An electron-microscopic study indi-
cated that there was only slight deterioration of the structure of mitochondria
of the ventricles. Mitochondria of the general type were mainly affected, and
those of the muscle type were well preserved.

1/1

1/2   018   UNCLASSIFIED   PROCESSING DATE--20NOV70
TITLE--MORPHOLOGICAL CHANGES IN CULTURED AMNION EPITHELIAL CELLS IN THE
PRESENCE OF AMINOACRIDINES -U-
AUTHOR-(03)-STEFANOVA, N.G., BIRYUZOVA, V.I., ZELENIN, A.V.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(2), 453-6

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--EMBRYOLOGY, MORPHOLOGY, CELL CULTURE, ELECTRON MICROSCOPY,
CYTOPLASM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1675   STEP NO--UR/0020/70/191/002/0453/0456

CIRC ACCESSION NO--AT0133580
                    UNCLASSIFIED

CIRC ACCESSICN NO--AT0133580
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SINGLE LAYER CULTURES OF STRAIN FL
OF CELLS OF HUMAN AMNYOTIC EPITHELIUM WERE INCUBATED WITH VARIOUS
CONCNS. CF ACRIDINE ORANGE AND PROFLAVINE AT VARIOUS TIME INTERVALS,
THEN SUBJECTED TO ELECTRON MICROSCOPIC EXAMN. BOTH NUCLEI AND CYTOPLASM
WERE ALTERED BY TREATMENT WITH THESE DYES AND PHOTOMICROGRAPHS OF
TYPICAL STRUCTURES WERE SHOWN. AT HIGHER CONCN. OF THESE DYES THERE IS
AN ACCUMULATION OF BASOPHILIC MATTER IN THE CYTOPLASM.   FACILITY:
INST. MOL. BIOL., MOSCOW, USSR.

UNCLASSIFIED

USSR

BYKOV, V. N., BIRZHEVOY, G. A., ZAKHAROVA, M. I., and SOLOV'YEV, V. A.

"The Nature and Thermal Stability of Radiation-Induced Defects in Single-Crystal Tungsten"

Abstract: The analysis of radiation-induced defects in tungsten shows that the interpretation of the types of defects characteristic for different annealing stages in tungsten is not well-defined. Investigation results are presented on the nature of radiation defects and their stability at temperatures to 2200°C in single-crystal tungsten irradiated at 450-500°C with a dose of $1.4 \cdot 10^{22}$ neutrons/cm^2. This irradiation brings about an increase in electric resistance by 18% at 298°K, by 140% at 77°K, and nearly by 1000 times at 4.2°K; it also results in an accumulation of rhenium in the amount of 0.2 at%. The characteristics of three identified annealing stages of radiation defects and their activation energies are given. The change of the specific electric resistance of single-crystal tungsten during irradiation is associated with the development of small accumulations by hydrogen atoms (20.2%), single vacancies and small accumulations of vacancies (16.5%), complex defects (43.3%), and also with

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USSR

the formation of rhenium (20%). The high integral flow of neutrons, the high irradiation temperature $[(0.20-0.21)T_{fusion}]$, and the absence of grain boundaries for the discharging of defects lead to an accumulation of basically complex defects, stable up to 1900°C and giving rise to the change of electric resistance. Four figures, three tables, twenty-two bibliographic references.

2/2

USSR

BIRENIYEE, L.V., VOROB'YEV, I.A.

"Thyristorized Pulse D-C Converter With Continuous Output Voltage"

V sb. Poluprovodniki i ikh primeneniye v elektrotekhn. (Semiconductors And Their Application In Electrical Engineering--Collection Cf Works), No 4, Riga, "Zinatne," 1970, pp 219-232 (from RZh--Elektronika i yeye primeneniye, No 10, October 1970, Abstract No 10B344)

Translation: The thyristorized pulse converter with continuous output voltage considered is intended for the power supply of a traction motor with series ex- citation. A L-shaped filter is provided at the input. The series-connected capaci- tor and motor and also a counter--series connected thyristor and semiconductor diode are connected in parallel with the input capacitor. A common point of the motor and capacitor, and a thyristor cathode are connected via a smoothing choke. For comp- utation an equivalent circuit is composed in which the input filter and motor are replaced by a counter EMF. A method is presented for an approximate determination of the smoothing inductance and capacitance (on the assumption of ideal smoothing of the current in the motor). In conformity with this method, computed dependences are given for determination of the pulsations of voltage and current in the elements of the circuit. 4 ill. 3 tab. 1 ref. I.R.

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BIRZVALK, Yu. A.

JPRS 60684
27 November 1973

CURRENT COEFFICIENTS OF A CONDUCTION MAGNETOHYDRODYNAMIC CONVERTER CONSIDERING THE M-SHAPE OF THE VELOCITY PROFILE

[Abstract of a Paper by Yu. A. Birzvalk, U. Ye. Peterson Given at the Magneto-hydrodynamic Conference, pp 134-135]

The M-shape of the velocity profile predicted by Shercliff [1] was investigated in reference [2] for the case of nonconducting channel walls. In the present paper, the same problem was solved for the condition of ϕ = const on electrodes (Figure 1), which corresponds to the condition of the magnetohydrodynamic channel operating in the pump mode (for $U_k > E$ = vBb) or of a generator (for $U_k < E$). The solution of the problem turned out to be qualitatively similar to the result of reference [2]: in the liquid, vorticity occurs and the M-configuration of the velocity profile connected with this (Figure 1). The vorticity factor $k_H = v_{min}/v_{max}$ is smaller, the larger $k_u = v_k/E$, that is, in the pump mode M-configuration of the profile is expressed more sharply than in the generator mode. Accordingly, the coefficients Γ_{ik} (i, k = 1, 2) also depend on k_u (Figure 2; here $k_* = \ell/b - 2$), and the primary equations of the magnetohydrodynamic channel [3] acquire the form (i — the channel feed current, i_d — the operating current):

$$U/\sigma = \Gamma_{11}U_k - \Gamma_{12}E = (\Gamma_{11} - \Gamma_{12})U_k - \Gamma_{12}E.$$

$$i_d/\sigma a = \Gamma_{21}U_k - \Gamma_{22}E = (\Gamma_{21} - \Gamma_{22})U_k - \Gamma_{22}E.$$

Here $\Gamma_{11} = f_{11}/f_{11}k_u \cdot f_{21} = f_{21}/f_{21}k_u$ (Figure 2). Consequently, for the linear dependence of Γ_{12} and Γ_{22} on k_u, the equations of the magnetohydrodynamic converter remain linear (1), but in then the principle of duality does not remain in effect ([3], equation (8); [4], pages 418-419): $\Gamma_{12} \neq \Gamma_{21}$, Γ_{22}. This leads to the fact that, in particular, the maximum efficiency in the pump and generator modes turn out to be different.

In Figure 2 for comparison we also have the calculus values of Γ_{11} = 2.641 (indicated by the circle) and $\Gamma_{12} = \Gamma_{21} = \Gamma_{11} - k_{ub}$, $\Gamma_{22} = \Gamma_{21} + k_q$ borrowed

- 52 -

BIRZVALK, Yu. A.

10,845
CSO: 8044/0653-H
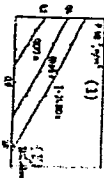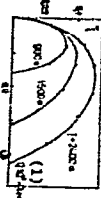
EXPERIMENTAL STUDY OF AN AC CONDUCTION PUMP USING A LIQUID-METAL SODIUM LOOP

[Abstract of a Paper by ____ ____ ____, Yu. V. Birzvalk, N. N. Nadezhnikov
Given at the Magnetohydrodynamic Conference, p 143]

An experiment: study was made of a laboratory model of a single-phase
ac conduction pump with the following parameters:

Rated head P_n = 0.4·10^5 n/m^2,
Rated output capacity Q_n = 3·10^{-3} m^3/sec,
Metal -- liquid sodium for T^0 = 400°C
Dimensions of the channel core   10 × 50 × 60 mm^3.

The experiment was performed on a liquid-metal Du-40 circuit of the
Physics Institute of the Latvian SSR Academy of Sciences.

The external characteristics p = $p(Q)$, the volt-ampere characteristics
u = $U(I)$ under the condition of p/Q^2 = const and the characteristics η = $\eta(Q)$
were determined. A study was also made of the distribution of the electric and
magnetic fields.

The basic experimental results are depicted in Figures 1 and 2.

Figure 1.
Key: 1. n/m^2
     2. m^3/sec

Figure 2.
Key: 1. m^3/sec

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USSR   UDC 621.317.715

PREOBRAZHENSKIY,A. A., BISHARD, YE. G., POLONSKIY, A. M., Leningrad Electro-
technical Institute imeni V. I. Ul'yanov

"Digital Ballistic Galvanometer"

Abstract: An integrator with code conversion of the magnitude of the magnetic
flux to pulse number code is investigated. The device is based on a ballistic
galvanometer with a photomask at the input of a special amplifier. It permits
complete automation of the process of measuring magnetic induction with the re-
sults obtained in digital form: the ballistic kick of the galvanometer is con-
verted to a proportional number of pulses by means of the three dimensional
coding converter (photomask) on the instrument scale. Recommendations are
made with respect to selecting the light sensitive transducer and the pulse
amplifier, and experimentally calculated characteristics of the integrating
device are presented.

     The proposed device permits measurement of the magnetic induction with
an error not exceeding the error from direct measurments by a ballistic
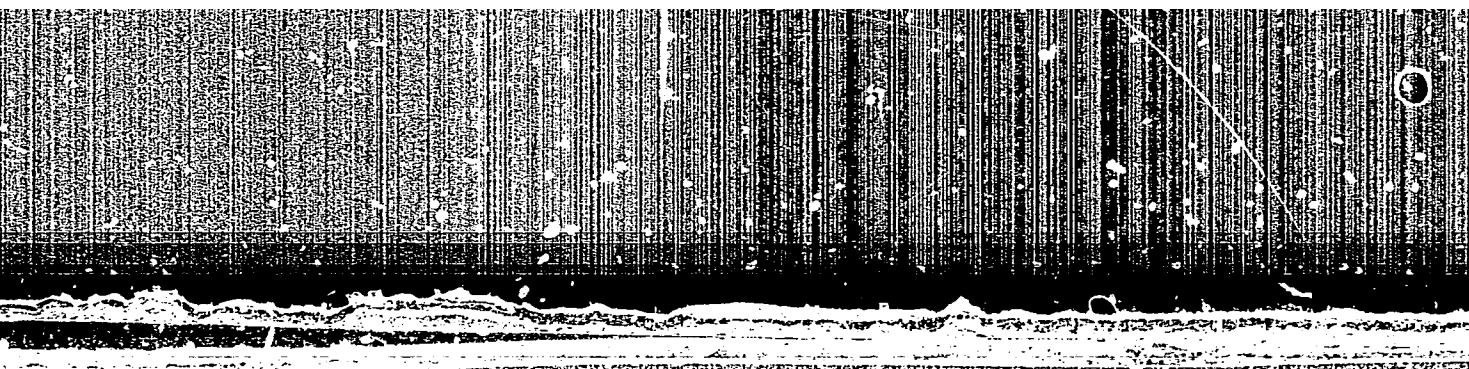1/2

USSR

PREOBRAZHENSKIY, A. A., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy --
Priborostroyeniye, Vol XIV, No 3, 1971, pp 17-20

galvanometer. With automatic limit selection of 40 seconds the measurement
time of the device is 10 seconds.

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Abstract: The analysis of radiation-induced defects in tungsten shows that the interpretation of the types of defects characteristic for different annealing stages in tungsten is not well-defined. Investigation results are presented on the nature of radiation defects and their stability at temperatures to 2200°C in single-crystal tungsten irradiated at 450-500°C with a dose of $1.4 \cdot 10^{22}$ neutrons/cm². This irradiation brings about an increase in electric resistance by 18% at 298°K, by 140% at 77°K, and nearly by 1000 times at 4.2°K; it also results in an accumulation of rhenium in the amount of 0.2 at%. The characteristics of three identified annealing stages of radiation defects and their activation energies are given. The change of the specific electric resistance of single-crystal tungsten during irradiation is associated with the development of small accumulations by hydrogen atoms (20.2%), single vacancies and small accumulations of vacancies (16.5%), complex defects (43.3%), and also with cumulations of vacancies (16.5%), complex defects (43.3%), and also with

1/2

USSR

BYKOV, V. N., et al., Atomnaya Energiya, Vol 33, No 4, Oct 72, pp 809-813

the formation of rhenium (20%). The high integral flow of neutrons, the
high irradiation temperature $[(0.20-0.21)T_{fusion}]$, and the absence of grain
boundaries for the discharging of defects lead to an accumulation of
basically complex defects, stable up to 1900°C and giving rise to the
change of electric resistance. Four figures, three tables, twenty-two
bibliographic references.

2/2

UDC 621.314.58

USSR

BIRZNIYEK, L.V., VOROB'YEV, I.A.

"Thyristorized Pulse D-C Converter With Continuous Output Voltage"

V sb. Poluprovodniki i ikh primeneniye v elektrotekhn. (Semiconductors And Their Application In Electrical Engineering--Collection Of Works), No 4, Riga, "Zinatne," 1970, pp 219-232 (from RZh--Elektronika i yeye primeneniye, No 10, October 1970, Abstract No 10B344)

Translation: The thyristorized pulse converter with continuous output voltage considered is intended for the power supply of a traction motor with series excitation. A L-shaped filter is provided at the input. The series-connected capacitor and motor and also a counter--series connected thyristor and semiconductor diode are connected in parallel with the input capacitor. A common point of the motor and capacitor, and a thyristor cathode are connected via a smoothing choke. For computation an equivalent circuit is composed in which the input filter and motor are replaced by a counter EMF. A method is presented for an approximate determination of the smoothing inductance and capacitance (on the assumption of ideal smoothing of the current in the motor). In conformity with this method, computed dependences are given for determination of the pulsations of voltage and current in the elements of the circuit. 4 ill. 3 tab. 1 ref. I.R.

1/1

BIRZVALK, Yu. A.

CURRENT COEFFICIENTS OF A CONDUCTION MAGNETOHYDRODYNAMIC CONVERTER CONSIDERING
THE N-SHAPE OF THE VELOCITY PROFILE

[Abstract of a Paper by Yu. A. Birzvalk, D. Yu. Peterson Given at the Magneto-
hydrodynamic Conference, pp 134-136]

The N-shape of the velocity profile predicted by Shercliff [1] was investi-
gated in reference [2] for the case of nonconducting channel walls. In the
paper, the same problem was solved for the condition of φ = const on electrodes
(Figure 1), which corresponds to the magnetohydrodynamic channel operating in
the pump mode (for $U_k > E = v_yB$) or a generator (for $U_k < E$). The solution of
the problem turned out to be qualitatively similar to the result of reference
[2]. In the liquid, vorticity occurs and the N-configuration of the velocity
profile connected with this (Figure 1). The vorticity factor $k_j = v_{min}/v_{max}$
is smaller, the larger $k_U = U_k/E$, that is, in the pump mode N-configuration of
the profile is expressed more sharply than in the generator mode. Accordingly,
the coefficients Γ_{ik} (i, k = 1, 2) also depend on k_U (Figure 2; here $i_a = 1/3 = 2$),
and the primary equations of the magnetohydrodynamic channel [3] acquire the
form (1 — the channel feed current, 1 — the operating current):

$$i_j/\sigma a = \Gamma_{11}U_k - \Gamma_{12}E - (\Gamma_{11}-\Gamma_{21})U_k - \Gamma_{12}E.$$

$$i_j/\sigma a = \Gamma_{21}U_k - \Gamma_{22}E - (\Gamma_{21}-\Gamma_{21})U_k - \Gamma_{22}E.$$

(1)

(Figure 2). Consequently, for the linear
dependence of Γ_{12} and Γ_{22} on k_U, the equations of the magnetohydrodynamic con-
verter remain linear (1), but in then the principle of duality does not remain
in effect (3), equation (8): [4], pages 418-419): $\Gamma_{20} \neq \Gamma_{21} - \Gamma_{22}$. This leads
to the fact that, in particular, the maximum efficiency in the pump and generator
modes turn out to be different.

In Figure 2 (or comparison we also have the calculus values of $\Gamma_{11} = 2,4$
(indicated by the circle) and $\Gamma_{12} = \Gamma_{21} = \Gamma_{11} = X_{ab}, \Gamma_{12} = \Gamma_{21} + x_q$ borrowed

- 52 -

BIRZVALK, Yu. A.

10,843
CSO: 8044/0653-M

EXPERIMENTAL STUDY OF AN AC CONDUCTION PUMP USING A LIQUID-METAL SODIUM LOOP

[Abstract of a Paper by Yu. A. Birzvalk, Ya. Y. Brivzhan, N. N. Nadzhmitov; Given at the Magnetohydrodynamic Conference, P 143]

An experimental study was made of a laboratory model of a single-phase ac conduction pump with the following parameters:

Rated head
$p_n = 0.4 \cdot 10^5$ n/m².

Rated output capacity
$Q_n = 3 \cdot 10^{-3}$ m³/sec.

Metal — liquid sodium for T⁰
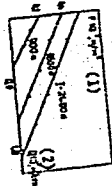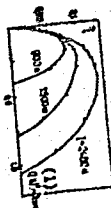$\theta_n = 400°C$

Dimensions of the channel core
$10 \times 50 \times 60$ mm³.

The experiment was performed on a liquid-metal Bu-40 circuit of the Physics Institute of the Latvian SSR Academy of Sciences.

The external characteristics, $P = p(Q)$, the volt-ampere characteristics, $U = U(I)$ under the condition of $p/Q²$ = const and the characteristics $\eta = \eta(Q)$ were determined. A study was also made of the distribution of the electric and magnetic fields.

The basic experimental results are depicted in Figures 1 and 2.

Figure 1.
Key: 1. n/m²
     2. m³/sec

Figure 2.
Key: 1. m³/sec

- 60 -

UDC 621.317.715

USSR

PREOBRAZHENSKIY, A. A., BISHARD, YE. G., POLONSKIY, A. M., Leningrad Electro-technical Institute imeni V. I. Ul'yanov

"Digital Ballistic Galvanometer"

Abstract: An integrator with code conversion of the magnitude of the magnetic flux to pulse number code is investigated. The device is based on a ballistic galvanometer with a photomask at the input of a special amplifier. It permits complete automation of the process of measuring magnetic induction with the results obtained in digital form: the ballistic kick of the galvanometer is converted to a proportional number of pulses by means of the three dimensional coding converter (photomask) on the instrument scale. Recommendations are made with respect to selecting the light sensitive transducer and the pulse amplifier, and experimentally calculated characteristics of the integrating device are presented.

The proposed device permits measurement of the magnetic induction with an error not exceeding the error from direct measurments by a ballistic

1/2

USSR

PREOBRAZHENSKIY, A. A., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy -- Priborostroyeniye, Vol XIV, No 3, 1971, pp 17-20

galvanometer. With automatic limit selection of 40 seconds the measurement time of the device is 10 seconds.

2/2

UNCLASSIFIED   PROCESSING DATE--30OCT70

TITLE--PLANE, CYLINDRICAL, AND SPHERICAL EXPLOSIONS IN A DETONATING GAS
WITH A COUNTERPRESSURE -U-

AUTHOR--BISHIMOV, YE.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK KAZAKHSKOI SSR, IZVESTIIA, SERIIA FIZIKO
MATEMATICHESKAIA, VOL. 8, JAN.-FEB. 1970, P. 43-48

DATE PUBLISHED-------70

SUBJECT AREAS--ORDNANCE, PROPULSION AND FUELS

TOPIC TAGS--GAS, DETONATION, EXPLOSION, MATHEMATIC FOUNDATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1523   STEP NO--UR/0361/70/008/000/0043/0048

CIRC ACCESSION NO--AP0118510
                          UNCLASSIFIED

PROCESSING DATE--30OCT70

UNCLASSIFIED

CIRC ACCESSION NO--AP0118510
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION OF THE PROBLEM OF THE PROPAGATION OF PLANE, CYLINDRICAL, AND SPHERICAL EXPLOSION WAVES IN A FUEL MIXTURE, TAKING COUNTERPRESSURE INTO ACCOUNT. IT IS ASSUMED THAT THE EXPLOSION OCCURRED AS A RESULT OF INSTANTANEOUS GENERATION OF ENERGY IN THE GAS ALONG A PLANE, A STRAIGHT LINE, OR AT A POINT. A NUMERICAL METHOD OF INTEGRAL RELATIONS IS USED TO CALCULATE THE PARAMETERS OF THE PERTURBED FLOW. THE INITIAL DATA ARE TAKEN FROM A LINEARIZED SOLUTION TO THE PROBLEM OF AN EXPLOSION IN A DETONATING GAS. THE RESULTS OF CALCULATIONS FOR VARIOUS VALUES OF THE POISSON ADIABATIC INDEX ARE PRESENTED FOR THE CASE WHERE THE HEAT GENERATION IS CONSTANT IN THE DETONATION WAVE AND FOR THE CASE WHERE IT DEPENDS ON THE COORDINATE OF THE WAVEFRONT, USING A METHOD WHERE THE UNKNOWN FUNCTIONS ARE APPROXIMATED BY FOURTH DEGREE POLYNOMIALS.

1/2   009   UNCLASSIFIED   PROCESSING DATE--16OCT70
TITLE--STRATIGRAPHICAL AND GEOMORPHOLOGICAL INVESTIGATIONS FOR
NEOTECTONICAL MAPPING, EXAMPLIFIED BY THE USSR NORTH EAST -U-
AUTHOR-(02)-BARANOVA, YU.P., BISKE, S.F.

COUNTRY OF INFO--USSR

SOURCE--GEOLOGIYA I GEOFIZIKA, 1970, NR 3, PP 3-11

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--STRATIGRAPHY, GEOMORPHOLOGY, GEOLOGIC MAPPING, TECTONICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1991/0747   STEP NO--UR/0210/70/000/003/0003/0011

CIRC ACCESSION NO--AP0110471
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0110471
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE NECESSARY CONDITIONS FOR
ANALYTICAL SYNTHETIC AND COMPLICATED NEOTECTONICAL MAPPING ARE
CONSIDERED IN THE PAPER. THE RECENT IDEAS OF SOME INVESTIGATORS ON
NORTH EAST NEOTECTONICS AND THEIR COMPARISON WITH NEW DATA ON
STRATIGRAPHY ARE ANALYZED. NEW SCHEME OF THE TERRITORY CONTINENTAL
DEVELOPMENT STAGES FOR DIFFERENT GEOSTRUCTURAL AREAS IN MESOZOIC AND
CENOZOIC IS PROPOSED BASED UPON RECENT DATA ON STRATIGRAPHY AND HISTORY
OF RELIEF DEVELOPMENT.   FACILITY: IGIG SO AN SSSR, NOVOSIBIRSK.

UNCLASSIFIED

Nuclear Physics

USSR

BISNOVATYY-KOGAN, G. S., ZEL'DOVICH, Ya. B. and SYUYAYEV, R. A.

"Equilibrium Concentration of Positrons in Optically Thin Relativistic Plasma"

Abstract: Physical processes are described for a low-density plasma in which radiation is emitted freely. The positron concentration is determined by the equilibrium processes of pair formation, by collisions of e^- and e^+ with nuclei and each other (without photon emission), and annihilation of electrons and positrons (with photon emission). The principal result is that there is no equilibrium states at temperatures above 20 mev, which is the upper temperature limit of an optically thin relativistic plasma. Relations are given for the second-order annihilation process, the number of annihilations per unit volume per unit time for a Maxwellian distribution of electrons and positrons, and pair formation by charged-particle collisions.
   Comparisons are made with processes in astrophysical radio sources in which there are no stationary states, little equilibrium, large temperature variations, and the positron concentration depends on the pumping energy. From energy con- siderations, pair generation is always much less than synchrotron radiation. In

USSR

BISNOVATYY-KOGAN, G. S., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 2, 20 July 1970, pp 64-67

the presence of a magnetic field positrons remain localized, while photons leave an optically thin region, when r < 1. A relativistic plasma of identical particles can exist for extended periods, and energy losses are compensated by radiation, shock waves and varying magnetic fields, as in the radio source regions of pulsars and quasars. Calculations made apply to plasmas having lifetimes longer than the time required for equilibrium to become established.

The authors thank A. Z. Dolginov for stimulating discussions. Orig. art. has 3 refs.

1/2   030

TITLE--RELATIVISTIC GAS SPHERES AND CLUSTERS OF POINT MASSES WITH ARBITRARILY LARGE CENTRAL REDSHIFTS: CAN THEY BE STABLE -U-

AUTHOR-(02)-BISNOVATYIKOGAN, G.S., THORNE, K.S.

COUNTRY OF INFO--USSR

SOURCE--ASTROPHYS. J. (USA), VOL. 160, NO. 3, PT. 1, P. 875-86 (JUNE 1970)

DATE PUBLISHED----JUN70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS

TOPIC TAGS--RELATIVISTIC QUANTUM MECHANICS, STAR CLUSTER, PERTURBATION, PLASMA STABILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605004/E06 STEP NO--US/0000/70/160/003/0875/0886

CIRC ACCESSION NO--AP0139664

CIRC ACCESSION NO--AP0139664

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RECENTLY BISNOVATYI-KOGAN AND ZEL'DOVICH HAVE CONSTRUCTED GENERAL RELATIVISTIC MODELS OF GAS SPHERES AND OF COLLISIONLESS STAR CLUSTERS, FOR WHICH THE REDSHIFT FROM THE CENTER TO INFINITY IS ARBITRATILY LARGE; AND THEY HAVE SPECULATED THAT THE PARTICULAR MODELS MIGHT BE STABLE AGAINST SMALL PERTURBATIONS. IN THIS PAPER IT IS PROVED THAT THE GAS SPHERES ARE, INDEED, STABLE AT LEAST AGAINST RADIAL PERTURBATIONS. AS FOR THE CLUSTERS, THE MOST POWERFUL TECHNIQUES YET DEVISED YIELD INCONCLUSIVE RESULTS FOR STABILITY. HOWEVER, FROM THE BEHAVIOR OF THE CLUSTERS UNDER SCRUTINY BY THOSE TECHNIQUES, THE AUTHORS BELIEVE THAT PROBABLY THEY ARE STABLE. FACILITY: ACAD. SCI., MOSCOW, USSR.

UNCLASSIFIED

UDC 51:621.391

USSR

BISTRITSKAS, V.

"A Continuous Analog of the Trichotomic Process of Dynamic Programming"

Lit. mat. sb. (Lithuanian Mathematical collection), Vol 13, No 3, 1973, pp 63-72 (abstract in Lithuanian and English) (from RZh Matematika, No 11, Nov 73, abstract No 11 V683)

Translation: A continuous analog of the trichotomic process of dynamic programming

$$f(x,y) = \max \begin{bmatrix} A: & p_1[r_1 x + f(1-r_1)xmy)], \\ B: & p_2[r_2 y + f(x, (1-r_2)y)], \\ C: & p_3[r_3 x + r_4 y + f((1-r_3)x, (1-r_4)y)] \end{bmatrix},$$

$$0 \leq p_i, \; r_j \triangleleft,$$

1/2

USSR

is constructed. In the continuous case, a problem of optimal control is obtained. It is shown that the continuous process of optimal control has not more than four areas of control (solutions) and that there exist values of the parameters for which this process has four regions of control. The regions of control are found in explicit form.
Abstract by the author.

2/2

- 69 -

UDC: 512.25/.26+519.3:330.115

USSR

BISTRITSKAS, V.

"On the Problem of Convergence of the Discrete Process of Optimum Control to the Continuous Process"

Lit. mat. sb. (Lithuanian Mathematics Collection), 1971, 11, No 1, pp 59--61 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V836)

Translation: It is proved that the control regions of a discrete optimum control process

$$l(x, y) = \max \begin{bmatrix} A : p_1^\Delta \{ ax\,\Delta + by\,\Delta + l\,(r_1^\Delta\,x,\ r_2^\Delta\,y)\}, \\ B : p_2^\Delta \{ cx\,\Delta + dy\,\Delta + l\,(s_1^\Delta\,x,\ s_2^\Delta\,y)\}, \end{bmatrix}$$

where $0 < p_i,\, r_i,\, p_2\, s_i < 1;\ i = 1,2;\ p_i\,\Delta > 0;\ x,\ y > 0$ converge to the control regions of its continuous analog as $\Delta \to 0$. Author's abstract.

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UDC 512.25/.26+519.3:330.115

USSR

RISTRITSKAS, V.

"Optimal Control of Continuous Process of Dynamic Programming in Infinite Time Interval"

Lit. Mat. Sb. [Lithuanian Mathematics Collection], Vol 10, No 4, 1970, pp 681-692, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V537 by the author).

Translation: A continuous version of the more general "goldmining" equation

$$f(x, y) = \max \begin{bmatrix} A: ax + by + p_1 f(r_1 x, r_2 y), \\ B: cx + dy + p_2 f(s_1 x, s_1 y) \end{bmatrix},$$

is studied when the parameters $|a|$, $|b|$, $|c|$, $|d|$; x, y, $P_i < \infty$, $i = 1, 2$, satisfy the inequality $0 \le p_1 r_i$, $p_2 s_i < 1$; x, y, $P_i \ge 0$. A problem in optimal control is produced. Among all permissible controls $\phi_1(t)$, $0 \le \phi_1(t) \le 1$, find the control for which the integral

$$\int_0^\infty x_1 [(ax_1 + bx_2) q_1(t) + (cx_1 + dx_2) q_2(t)] dt$$

takes on its least possible value, when the phase trajectory $x(t) = (x_1(t),$
$(x_2) \cdot (t))$ satisfies the system of differential equations

$$\frac{dx_1}{dt} = [q_1(t) \ln r_1 + q_2(t) \ln s_1] x_1(t), \quad x_1(0) = x;$$

$$\frac{dx_2}{dt} = [q_1(t) \ln r_2 + q_2(t) \ln s_2] x_2(t), \quad x_2(0) = y;$$

$$\frac{dx_3}{dt} = [q_1(t) \ln p_1 + q_2(t) \ln p_2] x_3(t), \quad x_3(0) = l,$$

where $\phi_2(t) = 1 - \phi_1(t)$. A synthesis of the optimal control is found.

UDC 512.25/.26+519.3:330.115

USSR

BISTRITSKAS, V.

"Infinite-Step Dichotomic Process for Solution of Dynamic Programming"

Lit. Mat. Sb., [Lithuanian Mathematics Collection], Vol 10, No 3, 1970, pp 445-452, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V556 by the author).

Translation: A theorem of the existence and uniqueness of a solution is proven for the most general "gold mining" equation:

$$f(x, y) = \max \begin{bmatrix} A: ax + by + p_1 f(r_1 x, \ r_2 y) \\ B: cx + dy + p_2 f(t_1 x, \ t_2 y) \end{bmatrix},$$

where the parameters a, b, c, d, r_i, t_i, $i = 1, 2$, satisfy the inequalities $0 \le p_1 r_i$, $p_2 t_i < 1$, $0 \le |a|$, $|b|$, $|c|$, $|d|$, x, y, $p_i < \infty$. The solution of this equation in the space of policies is found.

1/1

- 37 -

TITLE--RELATIVISTIC GAS SPHERES AND CLUSTERS OF POINT MASSES WITH
   ARBITRARILY LARGE CENTRAL REDSHIFTS: CAN THEY BE STABLE -U-

AUTHOR-(02)-BISNOVATYIKOGAN, G.S., THORNE, K.S.

COUNTRY OF INFO--USSR

SOURCE--ASTROPHYS. J. (USA), VOL. 160, NO. 3, PT. 1, P. 875-86 (JUNE 1970)

DATE PUBLISHED-----JUN70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS

TOPIC TAGS--RELATIVISTIC QUANTUM MECHANICS, STAR CLUSTER, PERTURBATION,
   PLASMA STABILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO------FD70/605004/E06 STEP NO--US/0090/70/160/003/0875/0886

CIRC ACCESSION NO--AP0139664
                    UNCLASSIFIED

CIRC ACCESSION NO--AP0139664

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RECENTLY BISNOVATYI-KOGAN AND ZEL'DOVICH HAVE CONSTRUCTED GENERAL RELATIVISTIC MODELS OF GAS SPHERES AND OF COLLISIONLESS STAR CLUSTERS, FOR WHICH THE REDSHIFT FROM THE CENTER TO INFINITY IS ARBITRATILY LARGE; AND THEY HAVE SPECULATED THAT THE PARTICULAR MODELS MIGHT BE STABLE AGAINST SMALL PERTURBATIONS. IN THIS PAPER IT IS PROVED THAT THE GAS SPHERES ARE, INDEED, STABLE AT LEAST AGAINST RADIAL PERTURBATIONS. AS FOR THE CLUSTERS, THE MOST POWERFUL TECHNIQUES YET DEVISED YIELD INCONCLUSIVE RESULTS FOR STABILITY. HOWEVER, FROM THE BEHAVIOR OF THE CLUSTERS UNDER SCRUTINY BY THOSE TECHNIQUES, THE AUTHORS BELIEVE THAT PROBABLY THEY ARE STABLE. FACILITY: ACAD. SCI., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 51:621.391

BISTRITSKAS, V.

"A Continuous Analog of the Trichotomic Process of Dynamic Programming"

Translation: A continuous analog of the trichotomic process of dynamic programming

$$
f(x,y) = \max \begin{bmatrix} A: & p_1\left[r_1 x + f(1-r_1)xmy)\right], \\ B: & p_2\left[r_2 y + f(x,(1-r_2)y)\right], \\ C: & p_3\left[r_3 x + r_4 y + f((1-r_3)x,(1-r_4)y)\right] \end{bmatrix},
$$

$$0 \le p_i, \quad r_j < 1,$$

1/2

USSR

is constructed. In the continuous case, a problem of optimal control is
obtained. It is shown that the continuous process of optimal control has not
more than four areas of control (solutions) and that there exist values of
the parameters for which this process has four regions of control. The regions
of control are found in explicit form.
Abstract by the author.

2/2

- 69 -

USSR

UDC: 512.25/.26+519.3:330.115

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"On the Problem of Convergence of the Discrete Process of Optimum Control to the Continuous Process"

Translation: It is proved that the control regions of a discrete optimum control process

$$L(x, y) = \max \begin{bmatrix} A : p_1^\Delta \ [ax\,\Delta + by\,\Delta + l\,(r_1^\Delta\,x,\ r_2^\Delta\,y)],\ \\ B : p_2^\Delta \ [cx\,\Delta + dy\,\Delta + l\,(s_1^\Delta\,x,\ s_2^\Delta\,y)],\ \end{bmatrix}$$

where $0 < p_i\,r_i,\ p_i\,s_i < 1;\ i = 1,2;\ p_i\,\Delta > 0;\ x,\ y > 0$ converge to the control regions of its continuous analog as $\Delta \to 0$. Author's abstract.

- 42 -

1/1

USSR   UDC 512.25/.26+519.3:330.115

BISTRITSKAS, V.

"Optimal Control of Continuous Process of Dynamic Programming in Infinite Time Interval"

Lit. Mat. Sb. [Lithuanian Mathematics Collection], Vol 10, No 4, 1970, pp 681-692, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V537 by the author).

Translation: A continuous version of the more general "goldmining" equation

$$f(x, y) = \max \begin{bmatrix} A: ax + by + p_1 f(r_1 x, r_2 y), \\ B: cx + dy + p_2 f(s_1 x, s_2 y) \end{bmatrix},$$

is studied when the parameters $|a|$, $|b|$, $|c|$, $|d|$; x, y, $p_i < \infty$, $i = 1, 2$, satisfy the inequality $0 \leq p_1 r_i$, $p_2 s_i < 1$; x, y, $p_i \geq 0$. A problem in optimal control is produced. Among all permissible controls $\phi_1(t)$, $0 \leq \phi_1(t) \leq 1$, find the control for which the integral

$$\int_0^{\infty} x_1 [(ax_1 + bx_2) q_1(t) + (cx_1 + dx_2) q_2(t)] dt$$

takes on its least possible value, when the phase trajectory $x(t) = (x_1(t), x_2(t), x_3(t))$ satisfies the system of differential equations

$$\frac{dx_1}{dt} = [\varphi_1(t) \ln r_1 + \varphi_2(t) \ln s_1] x_1(t), \quad x_1(0) = x;$$

$$\frac{dx_2}{dt} = [\varphi_1(t) \ln r_2 + \varphi_2(t) \ln s_2] x_2(t), \quad x_2(0) = y;$$

$$\frac{dx_3}{dt} = [\varphi_1(t) \ln p_1 + \varphi_2(t) \ln p_2] x_3(t), \quad x_3(0) = 1,$$

where $\phi_2(t) = 1 - \phi_1(t)$. A synthesis of the optimal control is found.

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USSR   UDC 512.25/.26+519.3:330.115

BISTRITSKAS, V.

"Infinite-Step Dichotomic Process for Solution of Dynamic Programming"

Lit. Mat. Sb., [Lithuanian Mathematics Collection], Vol 10, No 3, 1970,
pp 445-452, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971,
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where the parameters a, b, c, d, r_i, t_i, i = 1, 2, satisfy the inequalities

$0 \le p_i r_i$, $p_2 t_i < 1$, $0 \le |a|$, $|b|$, $|c|$, $|d|$, x, y, $p_i < \infty$. The solution of
this equation in the space of policies is found.

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- 37 -

USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on a Wavelength of 10.6µ
in Artificial and Natural Mists"

Abstract: The paper gives the results of measurements of the coefficients
of attenuation of laser emission on a wavelength of 10.6 µ in artificial
and natural mists on transmission paths of 15 m and 1.36 km respectively.
Experimental relations are presented for attenuation on 10.6 µ as a func-
tion of the attenuation on 0.63 µ and the meteorological visibility. It
is shown that attenuation on a wavelength of 10.6 µ is in many instances
less than the attenuation on 0.63 µ, and depends appreciably on the micro-
structure of the mist, which is in accord with the theoretical calculations.
Estimates of mist characteristics are given for both cases, which show that
the man-made mists are close to natural fog. Seven figures, one table,
bibliography of ten titles.

1/1

USSR

UDC 621.373.826:550

BISYARIN, V. P., BISYARINA, I. P., and SOKOLOV, A. V.

"Recurrence of Attenuation Factors at Wavelengths of 0.63 and 10.6 Microns in the Atmosphere"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 174-178 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10D378)

Translation: Estimation of the recurrence of attenuation factors for radiation in the atmosphere is of great interest from the viewpoint of determinations of the efficiency of optical lines of communication. Results are given of measurements of radiation at wavelengths of 0.63 and 10.6 microns which show that hydrometeorology makes the principal contribution to radiation attenuation. Weakening of the 10.6 micron radiation, caused by molecular absorption, is comparable to fog attenuation. A. K.

1/1

- 25 -

USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., RUDASH, V. K., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on Wavelengths of 10.6
and 0.63 µ in Atmospheric Precipitation"

Abstract: The paper presents the results of simultaneous measurements of
coefficients of attenuation of laser emission on wavelengths of 10.6 and
0.63 µ in snow, rain and drizzle which were made on a transmission path of
1.36 km in length. It is shown that attenuation on 10.6 µ exceeds that on
0.63 µ by an average factor of 1.4 in snow, and by an average factor of
1.2 in drizzle. In the case of rain, experimental relations on both wave-
lengths for the coefficients of attenuation as functions of the intensity
of the rain are compared with the relations calculated by Mie theory for the
size distribution of the raindrops in accordance with the data of Best and
Polyakova. It is shown that the attenuation on 10.6 µ is greater than on
0.63 µ in high-intensity rains. The authors thank M. A. Kolosov and Ye. V.
Sukhonin for constructive discussion of the results of the work. Seven
figures, bibliography of six titles.

1/1

- 81 -

USSR   .   UDC   621.373.826:550

BISYARIN, V. P., BISYARINA, I. P., and SOKOLOV, A. V.

"Recurrence of Attenuation Factors at Wavelengths of 0.63 and 10.6
Microns in the Atmosphere"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl.
(Tenth All-Union Conference on the Propagation of Radio Waves;
Report Theses—collection of works) "Nauka," 1972, pp 174-178 (from
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for radiation in the atmosphere is of great interest from the
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of communication. Results are given of measurements of radiation
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Weakening of the 10.6 micron radiation, caused by molecular absorp-
tion, is comparable to fog attenuation. A. K.

1/1

- 25 -

USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., RUDASH, V. K., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on Wavelengths of 10.6 and 0.63 μ in Atmospheric Precipitation"

Abstract: The paper presents the results of simultaneous measurements of coefficients of attenuation of laser emission on wavelengths of 10.6 and 0.63 μ in snow, rain and drizzle which were made on a transmission path of 1.36 km in length. It is shown that attenuation on 10.6 μ exceeds that on 0.63 μ by an average factor of 1.4 in snow, and by an average factor of 1.2 in drizzle. In the case of rain, experimental relations on both wavelengths for the coefficients of attenuation as functions of the intensity of the rain are compared with the relations calculated by Mie theory for the size distribution of the raindrops in accordance with the data of Best and Polyakova. It is shown that the attenuation on 10.6 μ is greater than on 0.63 μ in high-intensity rains. The authors thank M. A. Kolosov and Ye. V. Sukhonin for constructive discussion of the results of the work. Seven figures, bibliography of six titles.

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USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on a Wavelength of 10.6 μ
in Artificial and Natural Mists"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 10, Oct 71, pp 1758-1764

Abstract: The paper gives the results of measurements of the coefficients
of attenuation of laser emission on a wavelength of 10.6 μ in artificial
and natural mists on transmission paths of 15 m and 1.36 km respectively.
Experimental relations are presented for attenuation on 10.6 μ as a func-
tion of the attenuation on 0.63 μ and the meteorological visibility. It
is shown that attenuation on a wavelength of 10.6 μ is in many instances
less than the attenuation on 0.63 μ, and depends appreciably on the micro-
structure of the mist, which is in accord with the theoretical calculations.
Estimates of mist characteristics are given for both cases, which show that
the man-made mists are close to natural fog. Seven figures, one table,
bibliography of ten titles.

1/1

USSR   UDC 616.981.42=053.2

BISYARINA, V. P.

Brutsellez u Detey (Brucellosis Among Children), Moscow, "Meditsina," 1971,
176 pp

1/3

USSR

BISYARINA, V. P., Brutsellez u Detey, Moscow, "Meditsina," 1971, 176 pp

2/3

USSR

BISYARINA, V. P., Brutsellez u Detey, Moscow, "Meditsina," 1971, 176 pp

3/3

USSR

NEYLAND, O. Ya., KALNIN', S. V., and BITE, Dz. V., Riga Polytechnic Institute, Riga

UDC 547,447+547,233+547,821+541,651

"Acid-Base and Tautomeric Equilibria of Some New Derivatives of 1,3-Indandione"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya Khimicheskaya, No 6, 1970, pp 739-740

Abstract: The prototropic transformations of 1,3-indandione with onium substituents were studied. The betaine of 2-trimethylammonium-1,3-indandione (I, m. pt. 196-8°) was prepared by the action of Me_2SO_4 on 2-amino-1,3-indandione hexachlorostannate. By alkylating with Me_2SO_4 2-methylthio-1,3-indandione in a KOH solution, the betaine of 2-dimethylsulfonium-1,3-indandione (II; m. pt. 189-90°, lit. 190°) was obtained. The acidity and tautomeric equilibrium constants of I and II were determined and compared with those of 1,3-indandione and of 2-pyridinium, 2-methylthio, and 2-chloro-1,3-indandione (table). The constants based on measurements of protolysis in H_2O and EtOH characterized the C-acidity. Among onium substituents the greatest effect on the acidity was exerted by the SMe_2 group. The SMe group also exerted a considerable effect. The action of these two substituents can be explained by

1/2

USSR

NEYLAND, O. Ya., et al, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya
Khimicheskaya, No 6, 1970, pp 739-740

the participation of unfilled d-orbitals of the S-atom in the delocalization
of the electron in the anion formed by the substituted compound.

2/2

Corrosion

KUZ'MIN, G. S., Candidate of Technical Sciences, and BATINSKAYA, L. N.,
Engineer, Perm Polytechnic Institute

"Influence of Alloying Elements on Corrosion Resistance of Monel Alloy Welded
Joints"

Abstract: Results are presented from a study of the influence of alloying
of moneltype metals with aluminum, titanium, and manganese on the structure
and corrosion resistance of welded joints in gaseous hydrogen fluoride. The
corrosion resistance of these welded joints depends to a significant extent
on the type and quantity of alloying elements introduced to the seam metal.
Alloying with aluminum (up to 0.45%) causes some increase in corrosion rate,
while greater aluminum contents results in a decrease. As titanium is
introduced, the corrosion rate increases continually. A significant decrease
in the corrosion rate is observed as the content of magnesium in the seams
is increased.

1/1

USSR   UDC 669.71.053.4.094

LEYTEYZEN, M. G., BITNER, A. A.

"Obtaining Well-Precipitating Sludge after Leaching High-Silicon, Low-Iron
Bauxite"

Translation: The precipitability of slurries after leaching high-silicon,
low-iron bauxites in the successive Bayer-sintering system is investigated.
Laboratory and experimental-plant tests have established the dependence of
the precipitability of the slurry on the conditions of formation of the first
batches of hydroalumosilicate. A procedure is proposed for accelerating the
process of precipitating red slurries by seed crystallization of sodium
hydroalumosilicate. There are 2 illustrations.

1/1

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USSR

UDC 612.123.015.3:615-092

BITS', YU. V., and KOZHURA, I. M., Chair of Pathological Physiology, Kiev Medical Institute and Laboratory of Pathological Physiology Institute of Geronotology, Academy of Sciences, Ukrainian SSR, Kiev

"Some Disturbances in Lipid Metabolism Resulting From Exposure to Some Toxic Agents"

Kiev, Fiziologichesky Zhurnal, No 6, 1970, pp 745-749

Abstract: Some indices of lipid metabolism were studied in the blood serum of adult rabbits after subacute, acute, and chronic poisoning with propyl gallate, sodium fluoride, monoiodoacetic acid, and granosan. Changes in cholesterol and cholesterol fractions, total lipids, and beta lipoproteins tended to increase, the extent varying both with the particular compound administered and with the dose and duration of the poisoning. The mechanism of the resulting changes in lipid metabolism are considered in relation to the accompanying disturbances in carbohydrate metabolism. There is also a brief discussion of the part played by intoxication in the origin of degenerative vascular changes.

1/1

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1/2   009   UNCLASSIFIED   PROCESSING DATE--27NOV70
TITLE--ON THE THEORY OF MIXED TYPE EQUATIONS --U-

AUTHOR--BITSADZE, A.V.

COUNTRY OF INFO--USSR

SOURCE--MINSK, DIFFERENTSIAL 'NYYE URAVNENIYA (DIFFERENTIAL EQUATIONS),
   VOL VI, NO. 1, 1970, PP 3-6
DATE PUBLISHED-------70

SUBJECT AREAS--MATHEMATICAL SCIENCES

TOPIC TAGS--VECTOR, BOUNDARY VALUE PROBLEM, INTEGRAL EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0264   STEP NO--UR/0376/70/006/001/0003/0006

CIRC ACCESSION NO--AP0129498
                    UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AP0129498
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE CONCERNS THE PROBLEM
  OF FINDING A COMPLEX VARIABLE Z EQUALS X PLUS IY OF VECOTR U(Z),
  CONTINUOUS AND BOUNDED IN PLANE D SUBO, WHICH IS A SOLUTION OF THE
  EQUATION, SHOWN ON MICROFICHE, EVERYWHERE IN D SUBO EXCEPT IN THE
  NEIGHBORHOOD IN THE MAGNITUDE OF Z EQUALS 1 AND SATISFIES THE BOUNDARY
  CONDITION, SHOWN IN MICROFICHE, WHERE F IS A REAL FUNCTION WHOSE FIRST
  DERIVATIVE SATISFIES THE HOLDER CONDITION. THE SOLUTION IS REDUCIBLE TO
  AN EQUIVALENT HOMOGENEOUS SINGUALR INTEGRAL EQUATION, BUT COMPLICATIONS
  ARISE BECAUSE OF ADDITIONAL REQUIREMENTS IMPOSED ON THE SOLUTION OF THE
  BOUNDARY VALUE PROBLEMS.

UNCLASSIFIED

MATHEMATICS
Differential & Integral Equations

USSR

UDC 517.955.6

BITSADZE, A. V. (Institute of Mathematics Siberian Department Academy of Sciences USSR)

"On the Theory of Mixed Type Equations"

Abstract: The article concerns the problem of finding a complex variable $z = x + iy$ of vector $u(z)$, continuous and bounded in plane D_0, which is a solution of the equation

$$u_x + bu_y = 0, \qquad b = \begin{pmatrix} 0 & -1 \\ \operatorname{sgn}(|z| - 1) & 0 \end{pmatrix},$$

everywhere in D_0 except in the neighborhood $|z| = 1$ and satisfies the boundary condition
1/2

USSR

BITSADZE, A. V., _Differentsial'nyye Uravneniya_ (Differential Equations), Vol VI,
No 1, 1970, pp 3-6

$$u_1\vert_{y = x} = f(x), \quad x \in \left[\frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right],$$

where f is a real function whose first derivative satisfies the Hölder con-
dition. The solution is reducible to an equivalent homogeneous singular
integral equation, but complications arise because of additional requirements
imposed on the solution of the boundary value problems.

Orig. art. has 5 refs.

2/2

USSR   UDC: 621.791.3

ATAMANOV, V. N., Candidate Technical Sciences; BITSOYEV, G. D.
and ISAYEV, A. P., Engineers

"Equipment and Technique for Welding Integrated Circuit Leads to
Printed Circuit Plates"

Moscow, Pribory i sistemy upravleniya, No. 10, 1970, pp 52-54

Abstract: At the present time, solder with a low melting point
and flux is used for attaching integrated circuit leads to print-
ed circuit plates in industrial procedures. However, a number of
difficulties are involved in this method, and there is a tendency
to replace it with better welding processes such as the one pro
posed in this article. The basic principle here is that the volt-
age on the welding electrodes is automatically controlled, and
the increase or decrease in the cross sections of the elements to
be joined are automatically compensated by the increase or de-
crease in the welding current. The full schematic of the equip-
ment is given in the article together with details of the best
use of the method for various materials to be welded. The authors
conclude that this new method forms stable joints with nickel
printed-circuit leads.

1/1

USSR   UDC 532.57+532.137+536.51+532.14.08+531.787

SUDAKOV, P. YE., BITSUTA, V. K.

"Development and Investigation of a Viscosimeter for Continuous Measurement of Viscosity in a Flow"

Tr. Groznen. neft. in-t (Works of Groznenskiy Petroleum Institute), 1971, Collection 33, pp 196-197 (from RZh-Mekhanika, No 12, Dec 71, Abstract No 12B1633)

Translation: The design of a capillary viscosimeter for continuous monitoring and control of the viscosity of petroleum products in a flow is described. The viscosimeter consists of a capillary with a carefully polished surface into which the oil enters from the oil pipe with the aid of a semiplunger pump providing a constant supply. The pressure is taken with the aid of a differential manometer in a measuring section of the capillary and the manometer is connected through separating vessels. The differential manometer is connected with a secondary indicator graduated in viscosity units. A temperature compensation method is proposed for measuring viscosity under industrial conditions with an error of less than ±0.4 centistoke. The method is based on continuous correction of the indicator of the secondary instrument with the aid of a measuring sylphon through expansion of the measuring material contained in the cylinder of the thermomanometer system. The cylinder is placed in the flow of the product being studied. I. G. Bulina.
1/1

USSR

UDC: 621.391:621.317

BITUS, A. K., OVSYANNIKOV, V. A.

"Using Haar Functions to Measure the Law of Probability Distribution of Random Processes"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 3 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 3), Novosibirsk, 1970, pp 18-20 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A306)

Translation: The authors examine a method of plotting histograms for the distribution of interference amplitudes with irregular quantization of levels. Analysis of the distribution function is based on expanding it in a series in orthogonal functions, this expansion being treated as the algorithm of a measuring instrument. The circuit which realizes this algorithm is given; the system is essentially a single-program computer which can be made either in digital or analog form. An oscilloscope with persistence is used to register the distribution function. One illustration, bibliography of two titles. N. S.

1/1

USSR   UDC 621.314.61 (088.8)

KOSTROV, M.N., BITYAY, K.G.

"Push-Pull Device For Phase Control Of A Thyristorized Converter"

USSR Author's Certificate No 255225, filed 22 July 68, published 26 Mar 70 (from RZh--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 4B668P)

Translation: A circuit is proposed for phase control of a thyristorized con-
verter with rectifier and inverter groups of [semiconductor]rectifiers. Two pulse
shapers are used in the circuit, operating in antiphase. Each of the shapers con-
tains a charging capacitor, a discharging dynistor, and output pulse transformers,
the primary winding of which is connected into the discharge circuit of the cap-
acitors. A special feature of the proposed device is the handling of the charging
circuit of the capacitors. The capacitors are charged across two electron tubes
connected in the circuit of a balance amplifier. 1 ill. L.R.

1/1

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USSR   UDC: 621.372.413

BITYURIN, Yu. A., PAVEL'YEV, V. G., TSIMRING, Sh. Ye.

"Equivalent Resistance of a System of Two Resonators"

Translation: A system of two resonarots coupled through slots is considered.
Relationships are given which define the resonance frequencies and equivalent im-
pedance reduced to the coupling slots. Numerical evaluations show that the values
of the equivalent impedance in the case of tuned slots are comparable with the
corresponding values in the interaction spaces of hollow resonators used in klystrons
for the centimeter range. Data are given from experimental studies of a system of
coupled open resonators with spherical reflectors. Five illustrations, bibliography
of eight titles. Resumé.

1/1

USSR

BITYUTSKIY, V. I.; KAMENSKIY, G. A. (Moscow)

"Evaluation of the Mean Time to Servo Failure in a Nonlinear, Pulsed Servo System with Irregular Signals"

Moscow, Avtomatika i Telemekhanika; June, 1972; pp 57-64

ABSTRACT: For nonlinear servo systems with discrete, irregular data input the authors obtain integral equations with a varying argument whose solution is the mean time to servo failure, the time depending on the initial value of the error in the system. The calculations allow for the effect of processes whereby the failure signals are detected or recognized. Methods of solving the initial and boundary value problems for the integral equations obtained are described, and existence and uniqueness theorems for their solution are discussed. An example is given.

1/1

USSR   UDC 577.4

BITYUTSKIY, V. P.

"Synthesis in Band Structures"

Sintez v lentochnykh strukturakh (Synthesis in Band Structures), Institute of
Mathematics and Mechanics of the USSR Academy of Sciences, Sverdlovsk, 1971,
14 pp, ill., 1-entry bibliography, No 3654-71 Dep (from RZh-Kibernetika, No 9,
Sep 72, Abstract No 9V428)

Translation: The problem of implementing logical devices in band structures is
solved as the problem of expressing the representation from a symmetric half-
group by the product of representations from the given generating set. Various
algorithms are proposed for solving this problem under the condition that the
generating sets are realized on the simplest cascades of band structures. These
algorithms are a step-by-step procedure for constructing the solution. Reports
are presented on machine programs.

1/1

1/2   027   UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--COMMUTATION EFFECT IN BISMUTH TYPE SEMIMETALS —U—

AUTHOR-(04)-BIVOL, V.G., BODIUL, P.P., FEDORKO, A.S., GITSU, D.V.

COUNTRY OF INFO--USSR

SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 37, NR 2, PP 545-550

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--BISMUTH, BISMUTH ALLOY, ELECTROMOTIVE FORCE, MAGNETIC FIELD
   EFFECT, ANISOTROPY, HIGH TEMPERATURE EFFECT, ENERGY BAND STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0628   STEP NO--GE/0030/70/037/002/0545/0550

CIRC ACCESSION NO--AP0107225
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0107225

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEPENDENCE OF THE NERNST
   ETTINGSHAUSEN LONGITUDINAL EFFECT ON THE DIRECTION OF THE MAGNETIC FIELD
   FOR THE CASE OF SEMIMETALS IS STUDIED THEORETICALLY AND EXPERIMENTALLY.
   A QUITE UNIQUE CORRESPONDENCE IS FOUND BETWEEN THE ANISOTROPY OF THE
   EFFECT AND THE BAND STRUCTURE NEAR THE FERMI LEVEL. IT IS SHOWN THAT
   THE COMMUTATION EFFECT WHICH DETERMINES THE DEPENDENCE OF THE MAGNETO
   THERMO E.M.F. MAGNITUDE ON THE DIRECTION OF THE INDUCTION VECTOR,
   PERMITS TO JUDGE ABOUT THE NUMBER AND LOCALIZATION OF BAND EXTREMA IN
   THE K SPACE. THIS IS AN EFFECTIVE WAY FOR STUDYING BAND STRUCTURES OF
   BISMUTH AND ITS ALLOYS AT HIGH TEMPERATURES.

UNCLASSIFIED

USSR   UDC 627.8.05.69.055:624.147

BIYANOV, G. F., (Engineer), KAMENSKIY, R. M., (Candidate of Technical Sciences), and PAVLENKO, YU. G., (Engineer)

"Ice Crossing for Heavy Loads Under Conditions of the Extreme North"

Abstract: The organization and execution of an ice crossing of a river for transportation of heavy loads (power transformers) during construction of the Vilyuy river hydroelectric power plant are described. Calculations of the ice cover load carrying capacity were carried out by using the method of the theory of elasticity on the basis of data on systematical natural observations of the ice cover conditions, conducted by the Vilyuy Scientific Research Meteorological Station of the Institute of Geocryology of the Siberian Department of AN SSSR. Test conducted on an experimental crossing 100 m downstream from the main crossing confirmed the correctness and reliability of design methods for determining the admissible load for one-time transportation of heavy loads.

1/1

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USSR

UDC: 51:621.391

BIYASHEV, R. G., POLOSUKHIN, B. M.

"Using Nonpositional Polynomial Coding Over Galois Fields for Checking During Storage or Transmission of Information"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collected Scientific Works on Problems of Microelectronics. Moscow Institute of Electronic Technology), 1972, vyp. 9. (Physics and Mathematics Series), pp 217-222 (from RZh--Kibernetika, No 10, Oct 72, abstract No 10V454)

[No abstract]

1/1

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USSR

UDC: 681.3

BIYASHEV, R. G.

"Detection and Correction of a Double Error in Nonpositional Form"

Tr. in-ta mat. i mekh. AN KazSSR (Works of the Institute of Mathematics and Mechanics, Academy of Sciences of the Kazakh SSR), 1970, 1, pp 270--275 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V693)

Translation: The paper deals with a method of detecting and correcting a double error in a system of residual classes with polynomial bases in the presence of four control bases. The bases in which the errors took place and the magnitudes of the errors are found by solving a system of four equations modulo the control base. Author's abstract.

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1/1

USSR   UDC   517.9

BIYBOSUNOV, I., RYSKULOV, A., Frunze

"Numerical Solution of the Generalized Problem of Near Sonic Gas Flow
Around a Body"

Kazan', Izvestiya VUZov: Matematika, No 8(135), Aug 73, pp 8-14

Abstract: When a stream of gases flows around a body at a high subsonic
velocity, localized regions of supersonic velocities are set up near the
body if the velocity of the oncoming flow is sufficiently great. These
regions are bounded downstream by compression shocks which terminate
within the flow. In this paper the method of straight lines is used to
find an approximate solution of the problem of flow around a profile where
the localized supersonic zone is closed downstream by a straight com-
pression shock. Cases of absence of circulation are examined. The solu-
tion is found for symmetric and asymmetric flow around a profile. The
numerical solution gives a profile very close to a rhombus with slight
rounding on the sides. The authors thank S. V. Fal'kovich for construc-
tive criticism.

1/1

USSR

BIYBOSUNOV, I., KARYBEKOV, N.

"Planar Transsonic Flow of Curved Shock Wave"

Moscow, Mekhanika Zhidkosti i Gaza, No 5, Sep-Oct 70, pp 78-83

Abstract: An example is studied of plane-parallel flow which has zones of sub- and supersonic velocities, divided by a shock wave and transition line.   The shock wave front approaches the transition line at a right angle, separating a quadrant in the physical plane where the flow velocity is subsonic.   In the other three quadrants, the velocity of a particle exceeds the speed of sound, so that the flow cannot be used for the study of local properties of the field of velocities in the classical problem of termination of a shock wave on a transition line in a local supersonic zone.   In constructing the shock wave, the authors used the method of perturbations; the desired quantities are expanded into a series with respect to a small parameter.

1/1

BIYELIS, I. YA.

XIII-8n.   LIQUID HETEROEPITAXY BY THE ZONE MELTING METHOD

[Article by I. Ya. Biyelis, A. A. Patmalnikw, Riga; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian; 12-17 June 1972, p 194]

In this paper a study was made of the thermal conditions of zone melt- ing, for which it is possible to realize liquid heteroepitaxy.

It is demonstrated that the monocrystalline growth is caused both by the epitaxy process and by the process of lateral growth of the layer along the substrate.

The results are presented from a study of the liquid heteroepitaxy of Ge on Si and Si on SiC by the zone melting method.

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USSR

UDC: 539.23

BIYELIS, I. Ya., PATMALNIYEKS, A. A., Latvian State University imeni P. Stuchka

"Peculiarities of the Nucleation and Growth of Germanium and Silicon Thin Films Produced by Zone Melting"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR: Seriya Fizicheskikh i Tekhnicheskikh Nauk, No 5, 1972, pp 32-37

Abstract: The paper presents some results of an investigation of the catalytic influence of substrate and points out some of the particulars of nucleation and growth of thin films of silicon and germanium made by the method of zone melting. It is found that the disorienting effect of the substrate can be qualitatively evaluated from the ratio of the work of adhesion W'_A of the system made up of the melt and the material being crystallized. to the work of adhesion W''_A of the system comprised of the melt and the substrate. The influence of the substrate increases with a reduction in this ratio. and becomes appreciable when W'_A/W''_A decreases to a value of the order of unity or less. Directional growth of a thin film with diamond lattice in the case of random multiple nucleation takes place in the form of banded

1/2

USSR

BIYELIS, I. Ya., PATMALNIYEKS, A. A., Izvestiya Akademii Nauk Latviyskoy SSR:
Seriya Fizicheskikh i Tekhnicheskikh Nauk, No 5, 1972, pp 32-37

grains growing in direction <112> as a result of mutual rearrangement.   The
method of zone melting can be used with a seed to grow single-crystal layers
with a given orientation on unoriented, dissimilar substrates.

2/2

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USSR   UDC [537.226+537.311.33]:[537+535]

GUBKIN, A. N., BIYEVETSKIY, E. A., SHARNOPOL'SKAYA, YE. T.

"Glass Electrets"

Tr. Mosk. in-ta elektron. mashinostr. (Works of Moscow Institute of Electronic Machine Building), 1970, No. 8, pp 108-118 (from RZh Fizika, No 12, Dec 71, Abstract No 12Yel155)

Translation: Correction methods and the properties of electrets of a pyroceramic of various compositions (cordierite, glass-porcelain, and placopyroceramic) and borosilicate glass with liquation are described. The physical nature of the residual polarization in the glasses and the role of the heterogeneous structure in the electret effect are discussed. Resume.

1/1

Surgery

USSR

UDC 616.831-006-085.832.9

KANDEL', E. I. and BIYEZIN', O. A., Institute of Neurology, Academy of Medical Sciences USSR

"Cryosurgery of Brain Tumors in Man"

Abstract: Cryosurgery is gaining acceptance as a preferred method for the treatment of brain tumors, because it is simpler, faster, and yields equal or better results than conventional surgery. The authors used an improved stereotaxic instrument for cryosurgery of gliomas and meningiomas on 50 patients. Cryoextirpation was performed on superficial tumors, cryodestruction on deep tumors, and a combination of both procedures was used on diffuse nodular tumors. A long-term followup of the patients revealed good results. Experimental studies were done on laboratory animals to investigate postoperative histology. It was found that cryodestruction is succeeded by dissolution and resorption of the necrotized tumor, with subsequent formation of a harmless cyst. Deep-freezing destroys capillaries, however, without causing hemorrhages. Larger blood vessels with well

1/2

USSR

KANDEL', E. I. and BIYEZIN', O. A., Voprosy Neyrokhirurgii,
Vol 1, Jan/Feb 71, pp 3-9

developed connective tissue in their walls are temporarily
blocked by ice thrombi; upon thawing, normal blood circulation
resumes. The method is promising and worthy of further investi-
gation and expansion.

2/2

Crystals & Semiconductors

BIYUSHKIN, V. N.,-BELOV, N. V., Institute of Crystallography, Academy of
Sciences of the USSR, Mordov State University

"Structure-Localizing Cross Sections of the Doubled Patterson Function of
the Second Kind"

Abstract: The introduction of two independent symmetry transformations to
set the vector parameters of the doubled Patterson function defines the
cross section which contains the representations of the structure in a
fixed atom and in other atoms arranged in an analogous manner relative to
the given elements of symmetry or pairs which are similar to them. The
fixation of two elements considerably restricts the admissible regions for
the reflecting atoms as compared with cross sections of the first kind.

1/1

AT0039749   NUCLEAR SCI. ABST. 3-70   UR 0000

8134   THE PHASE COMPOSITION AND STRUCTURE OF
NICKEL-ALUMINUM ALLOY CATALYSTS WITH ADDITIONS
OF TITANIUM AND ZIRCONIUM. Bizhanov, F. B.; Sokol'skii,
D. V.; Khisametdinov, A. M.; Omarov, A. K.; Ongarbaev, S. O.
Tr. Inst. Khim. Akad. Nauk Kaz. SSR: 22: 127-37 (1966). (In
Russian).

X-ray, metallographic, and chemical methods, as well as mea-
surements of total hardness and the microhardness of phases,
were used to study the phase composition and structure of catalyst
alloys, Ni–50% Al, with or without Ti and Zr additions. In the
preparation of catalysts, leaching of the alloys converted the Ni_3Al
and $NiAl_3$ phases into finely crystalline Ni with a fcc lattice. The
presence of Ti and Zr additions had some effect on the structure of
the Ni. (Referativnyi Zh.)

LD

19741037

7

TITLE--CATALYTIC AND ADSORPTION PROPERTIES OF MIXED CATALYSTS BASED ON
  NICKEL -U-

AUTHOR-(05)-KASIMOVA, G.I., BIZHANOV, F.B., SOKOLHSKIY, D.V., POPOV, N.I.,
  KHISAMETDINOV, Z.M.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK KAZ. SSR, SER. KHIM. 1970, 20(2), 20-4

DATE PUBLISHED------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CATALYST ACTIVITY, NICKEL, MAGNESIUM OXIDE, HYDROGENATION,
  ORGANIC NITRO COMPOUND, PHENOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2029   STEP NO--UR/0360/70/020/002/0020/0024

CIRC ACCESSION NO--AP0125617
                        UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0125617
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF MGO
    ADDNS. ON THE ACTIVITY OF A NI CATALYST. THE CARRIER:NI RATIO WAS
    CONST., 4:1. THE ACTIVITY OF THE NI CATALYSTS FOR THE HYDROGENATION OF
    O-NITROPHENOL INCREASED 2.5 TIMES UPON USING A CARRIER AND FOR THE ADDN.
    OF MGO; THE OPTIMUM ADDN. BEING NI:MGO EQUALS 1:0.2. A COMPARISON OF
    THE CATALYTIC AND ADSORPTION PROPERTIES SHOWED THAT THEIR CHANGES ARE
    SYMBATIC. THE MAX. ACTIVITY WAS OBTAINED FOR SAMPLES REDUCED AT
    250DEGREES FOR NI, AT 400-50DEGREES FOR THE NI:CLAY EQUALS 1:4 CATALYST,
    AND AT 350-400DEGREES FOR THE NI:MGO CATALYST. FOR THE PROMOTED
    CATALYST THE REACTION IS LIMITED BY THE ACTIVATION OF THE UNSATD. COMPD.
        FACILITY: KAZ. KHIM.-TEKHNOL. INST., CHIMKENT, USSR.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A HYDROGENATION CATALYST FOR
  MONOSACCHARIDES CONSISTED OF NI, AL, AND FE, WITH 2 WT. PERCENT MN
  ADDED.   FACILITY: KAZAKH CHEMICAL TECHNOLOGICAL INSTITUTE.

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Antennas
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"Antenna"

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Translation: For wireless   high-frequency communication in mines, inductive transmitting antennas have hitherto been used in the form of frames with or without cores, operating into unmatched loads and having low Q. To eliminate these deficiencies and increase the current, an antenna has been proposed in the form of two insulated sheets (e.g., paralonic) with electrically conducting layers (e.g., foil) between them. Such a layer is used as the plate of a capacitor, introduced in the tuned circuit of the transmitter, while the upper roof of the electric car storage cell is used as the other plate. Yu. V.

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